

Service Manual

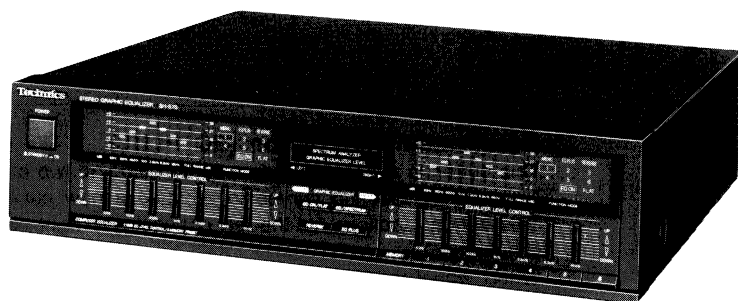
Stereo Graphic Equalizer

Equalizer

SH-E75

Color

(K) Black Type



SPECIFICATIONS (DIN 45 500)

Frequency response (center position)	5 Hz ~ 100 kHz, -3 dB
Maximum output voltage	8 V (1 kHz, THD 0.03%)
Rated output voltage	1 V
Maximum input voltage	8 V (1 kHz)
Input sensitivity	1 V
Rated total harmonic distortion	0.005% (20 Hz ~ 20 kHz), at 1 V output 0.003% (1 kHz), at 1 V output
Signal-to-noise ratio	98 dB/1 V (105 dB/1 V, IHF 'A)
Input impedance	47 k Ω
Gain	0 $\pm$ 1 dB
Channel balance 250 Hz ~ 6300 Hz	$\pm$ 0.5 dB
Channel separation 1 kHz	70 dB
Equalization-level controls	+12 dB ~ -12dB (7 frequency ranges, in 2-dB steps)

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Area

Color	Area
(K)	(EX) Continental Europe.
(K)	(EW) Switzerland.
(K)	(Ei) Italy.
(K)	(EG) F.R.Germany.
(K)	(EB) Belgium.
(K)	(EK) United Kingdom.
(K)	(EF) France.
(K)	(EH) Holland.
(K)	(XL) Australia.
(K)	(XA) Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	(XB) Saudi Arabia.

Center frequency	63 Hz, 160 Hz, 400 Hz, 1 kHz 2.5 kHz, 6.3 kHz, 16 kHz
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GENERAL

Power supply	AC 220 V, 50 Hz/60 Hz
For Continental Europe	AC 240 V, 50 Hz/60 Hz
For United Kingdom and Austraria	AC 110 V / 127 V/ 220 V / 240 V,
For others	50 Hz/60 Hz
Power consumption	11 W (with power switch at STANDBY:6.5 W)

Dimensions (W x H x D)	360 x 91 x 287 mm (14-3/16" x 3-19/32" x 11-5/16")
Weight	2.8 kg (6.2 lb.)

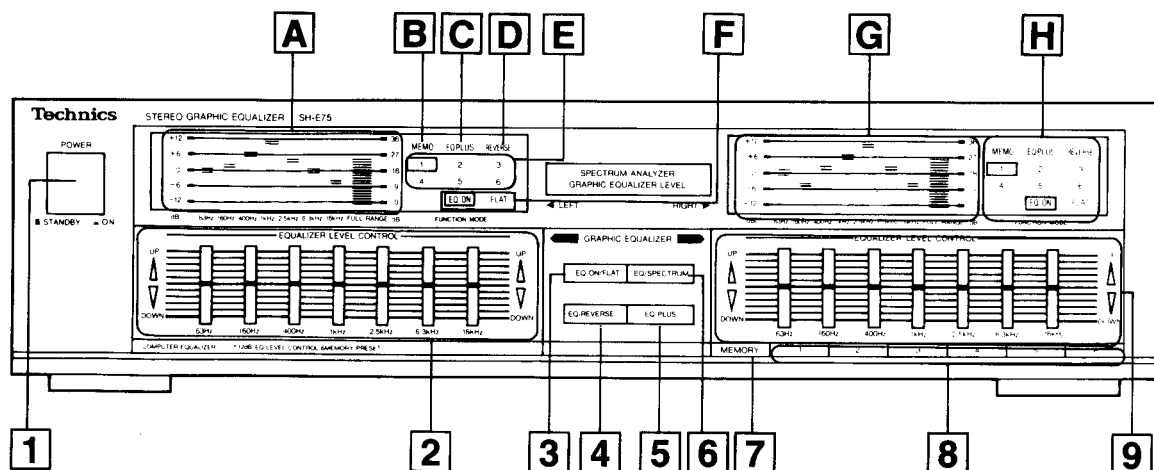
Specifications are subject to change without notice for further improvement. Weight and dimensions are approximate.

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Technics

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

■ LOCATION OF CONTROLS



1 Power "STANDBY" switch

This switch turns ON and to STANDBY the secondary circuit power only. The unit is in the "STANDBY" condition when this switch is set to the "STANDBY" position. Regardless of the switch setting, the primary circuit is always "live" as long as the power cord is connected to an electrical outlet:

Note:

• For this unit, even if this switch is switched to the "STANDBY" position, there is still a slight power consumption of about 6.5 watts; this is in order to assure the retention of the "most recent" memory and the preset-memory functions.

"Power-through" function

Discs, radio broadcasts, etc. can be heard even if the power of this unit is switched to STANDBY. Note, however, that the power plug should be left connected to the AC outlet.

2 Left-channel level-control buttons (EQUALIZER LEVEL CONTROL)

These buttons are used for adjustment of the equalization level of the left channel. When the button corresponding to the frequency to be adjusted is pressed, the equalization level of the left channel changes in 2-dB steps.

If a button is pressed and held, the equalization level of the left channel can be varied continuously throughout a maximum range of ± 12 dB.

3 Equalization mode-select button (EQ ON/FLAT)

This button is used to switch the equalization correction function "EQ ON" and "FLAT". This button functions for the left channel and right channel simultaneously. Each time a button is pressed, the mode changes alternately to one or the other of the following modes.

EQ ON: Select this mode to make an equalization correction.

FLAT: Select this mode if no equalization correction is desired.

Note that the "EQ ON" mode is automatically selected if a preset-memory button or a level-control button is pressed while this button is set to the "FLAT" mode.

4 Reverse button (REVERSE)

This button is used to reverse the equalization curve shown in the display.

This button functions for the left channel and right channel simultaneously.

When this button is pressed, the equalization curve is reversed; when pressed again, the reversing is released.

5 Equalization-plus button (EQ PLUS)

This button is used when you want to combine two or more types of equalization curves to produce a new curve. This button functions for the left channel and right channel simultaneously.

When equalization curves are combined, note that the equalization characteristic and level for the resulting new curve can be displayed to a maximum of ± 12 dB.

6 Display mode button (EQ/SPECTRUM)

This button is used to select either the display of the spectrum or of the equalization level. This button functions for the left channel and right channel simultaneously.

Each time a button is pressed, the mode changes alternately to one or the other of the following modes.

EQ: Select this mode if you want to display the equalization level.

SPECTRUM: Select this mode if you want to display the spectrum.

7 Memory button (MEMORY)

This button can be used to store the equalization curve in the memory.

This button functions for the left channel and right channel simultaneously.

8 Preset-memory buttons (1-6)

These buttons can be used to store equalization curves into the memory, or to retrieve (from the memory) curves that have been stored in the memory. These buttons function for the left channel and the right channel simultaneously. As many as six curves can be stored in the memory for the left and right channels. To erase a curve stored in the memory, simply enter a new curve to replace it in the memory.

9 Right-channel level-control buttons (EQUALIZER LEVEL CONTROL)

These buttons function in the same way as the left-channel level-control buttons.

A Left-channel spectrum/equalization display
The display shows the left channel spectrum or equalization level. The spectrum is shown by using bars, and the equalization level is shown by using a dot-type (=) display. The "FULL RANGE" area on the right side displays the combined level of all of the frequency bands.

B Left-channel equalization-memory indicator (MEMO)
The frame of this indicator illuminates when the memory button is pressed; when a preset-memory button is then pressed and the memory entry is completed, the frame illumination will stop.
To stop the memory at any time, press the memory button once again; the frame illumination will stop and the memory will be stopped.

C Left-channel equalization-plus indicator (EQ PLUS)
This indicator will flash for about five seconds when the equalization-plus button is pressed. The frame will illuminate when a new curve has been produced from two or more curves.

D Left-channel reverse indicator (REVERSE)
The frame of this indicator illuminates when the reverse button is pressed.
Note, however, that there will be no illumination if the equalization curve is flat.

E Left-channel equalization-preset indicators (1~6)
The frame of the indicator (1~6) corresponding to the pressed preset-memory button will illuminate.

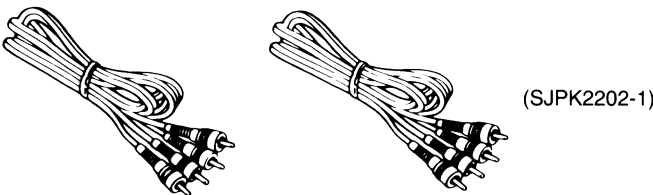
F Left-channel equalization-mode indicators (EQ ON/FLAT)
When the equalization mode-select button is pressed, the frame around the "EQ ON" indicator will illuminate; when it is pressed again, the frame around the "FLAT" indicator will illuminate.

G Right-channel spectrum/equalization display
The display shows the right channel spectrum or equalization level. The display of the spectrum or equalization level is shown in the same way as for the left channel.

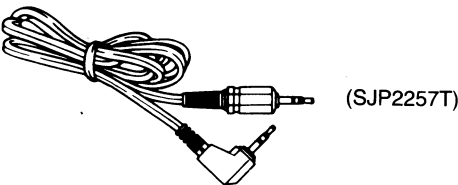
H Right-channel indicators (FUNCTION MODE)
The function of these indicators is the same as explained for the left-channel indicators.

ACCESSORIES

•Stereo connection cables 2

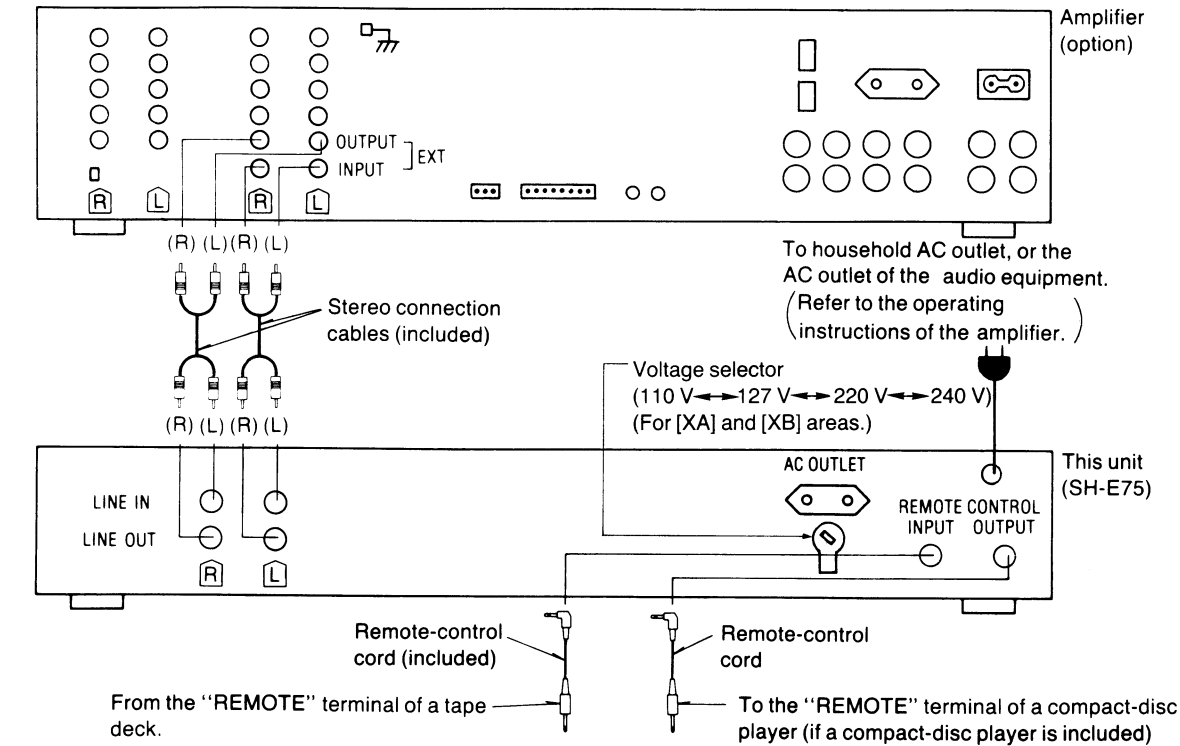


•Remote-control cord 1



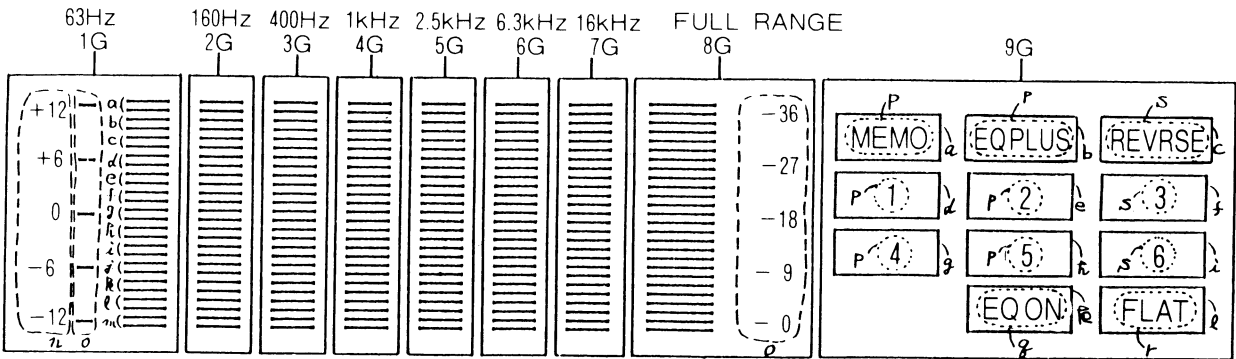
CONNECTIONS

This is an equalizer that provides effects both during tape recording and playback if it used while connected to an amplifier (such as models SU-X990D, SU-X980D, SU-X950, etc.) that has "EXT IN/OUT" terminals.
If this unit is connected to an amplifier that does not have "EXT IN/OUT" terminals, its effects are limited to playback only.



DESCRIPTION OF FL PANEL

•GRID ASSIGNMENT

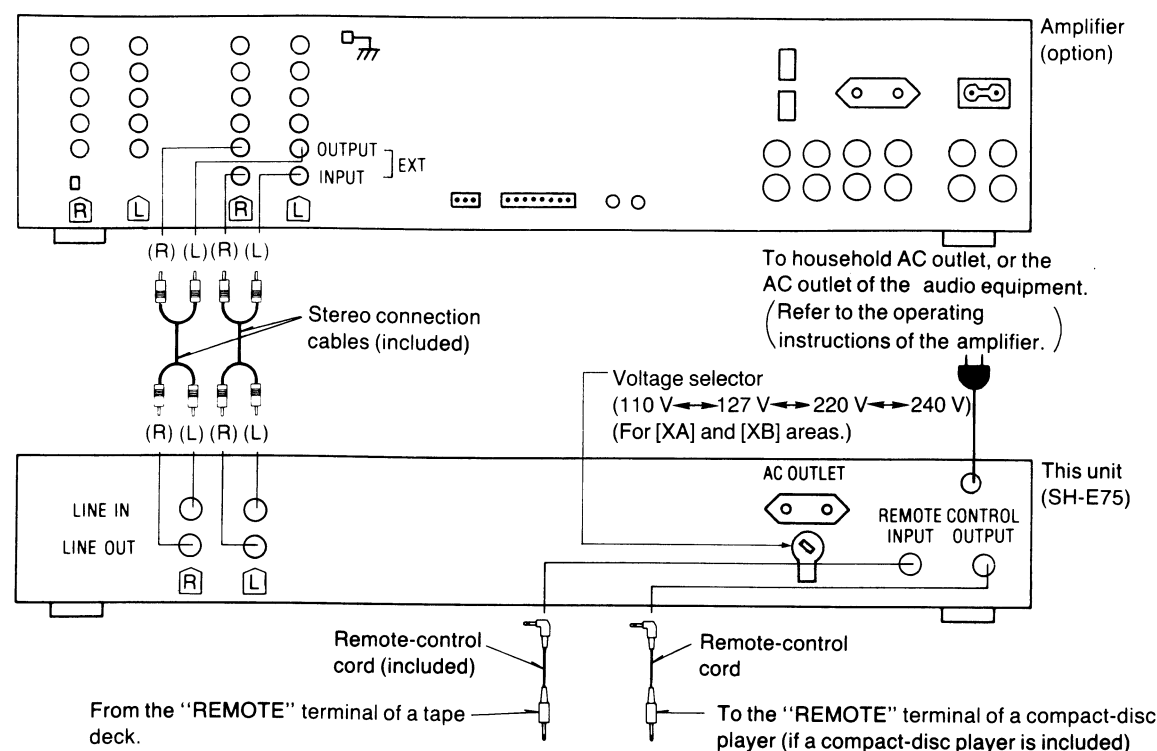


•PIN CONNECTION

Segment terminal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
Name of terminal	F 1	F 1	N P	N P	N n	N P	N G	N P	N P	N 2	N P	N P	N 3	N P	N 4	N G	N P	N 5	N P	N 6	o	a	7 G	b	c	d	8 G	e	f	g	h	i	j	k	l	N P	m	p	q	r	s	9 G	N P	N P	N 2	F 2

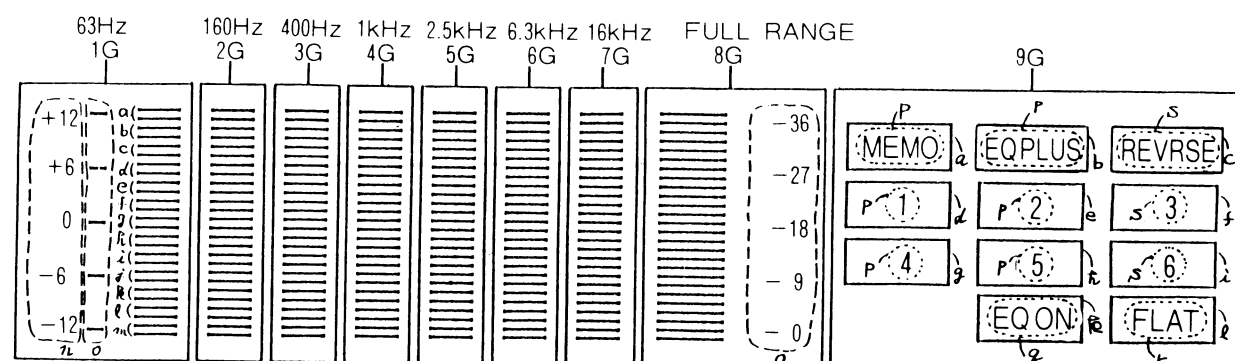
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■ DESCRIPTION OF FL PANEL

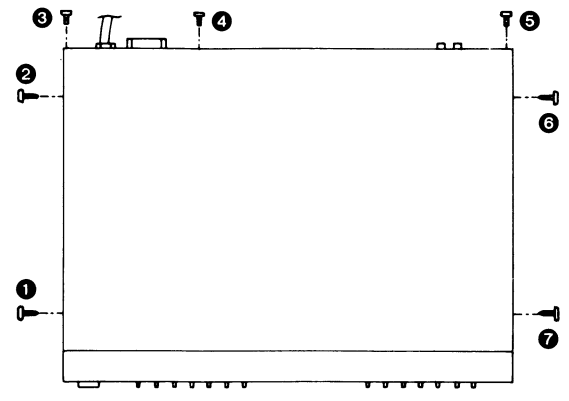
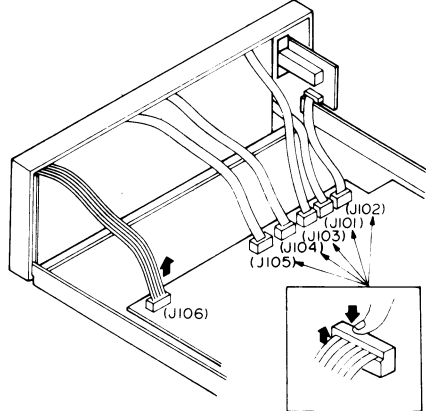
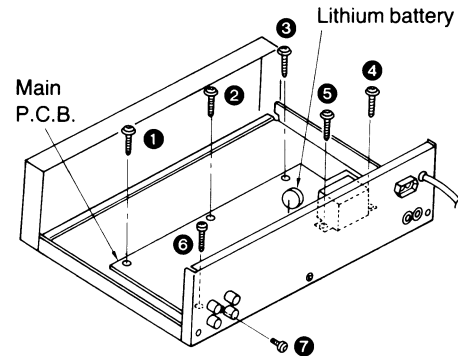
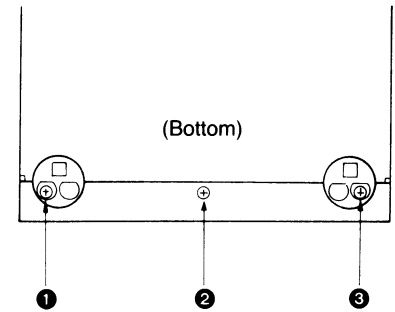
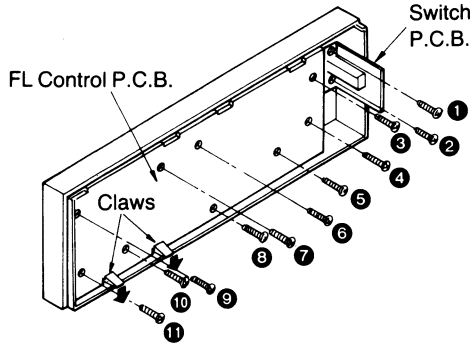
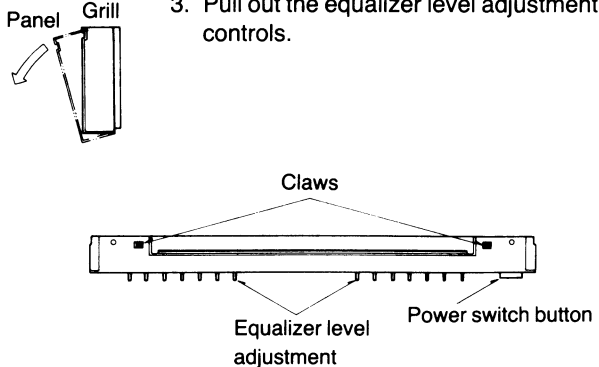
● GRID ASSIGNMENT



● PIN CONNECTION

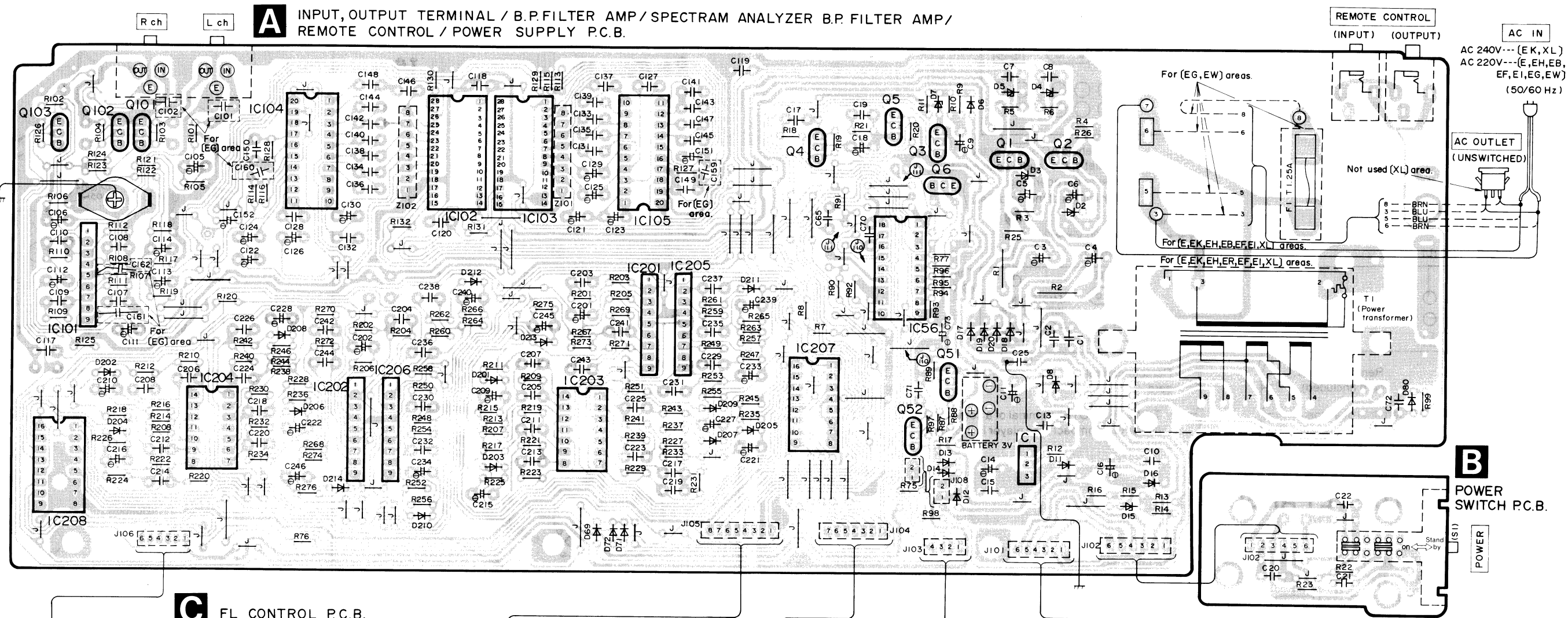
Segment terminal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46		
Name of terminal	F	F	N	N	N	1	N	N	2	N	N	3	N	4	N	N	5	N	6	G	a	7	G	b	c	d	8	G	e	f	g	h	i	j	k	l	N	p	m	q	r	s	9	N	N	F	F	2

■ DISASSEMBLY INSTRUCTIONS

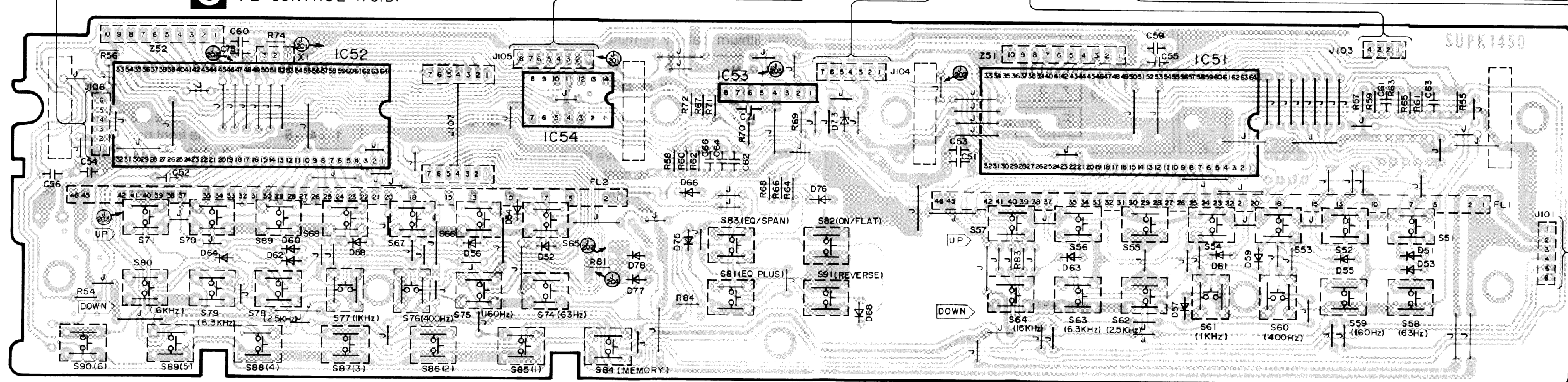
Ref. No. 1	How to remove the cabinet	Ref. No. 2	How to remove the connector
Procedure 1	● Remove the 7 screws (1~7).	Procedure 1→2	● Disconnect the lead ties of the 6 connectors (J101, J102, J103, J104, J105, J106).
			
Ref. No. 3	How to remove the main P.C.B.	Ref. No. 4	How to remove the front panel
Procedure 1→3	1. Remove the 6 screws (1~6). 2. Remove a screw (7) from the jack P.C.B.	Procedure 1→2→4	● Remove the 3 screws (1~3)
			
	● To remove the lithium battery (as an additional power of memory), remove the main P.C.B., and unsolder the lithium battery terminal.		
Ref. No. 5	How to remove the switch P.C.B., and FL control P.C.B.	Ref. No. 6	How to remove the equalizer level adjustment controls
Procedure 1→4→5	1. Remove the 2 screws (1, 2) from the switch P.C.B. 2. Remove the 9 screws (3~11) from the FL control P.C.B. 3. Remove the 2 claws and remove the FL control P.C.B.	Procedure 1→4→5→6	1. Remove the 2 claws on the lower side of the front panel. 2. Take the panel and grill apart in the direction of the arrow. 3. Pull out the equalizer level adjustment controls.
			
			Note: The power switch button is turned on.

CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

A INPUT, OUTPUT TERMINAL / B.P. FILTER AMP / SPECTRAM ANALYZER B.P. FILTER AMP /
REMOTE CONTROL / POWER SUPPLY P.C.B.



C FL CONTROL P.C.B.



Power Sou

SC

(This schem

Notes:

- S1
- S2

•S51~S57

•S58~S64

•S65~S71

•S74~S80

•S81

•S82

•S83

•S84

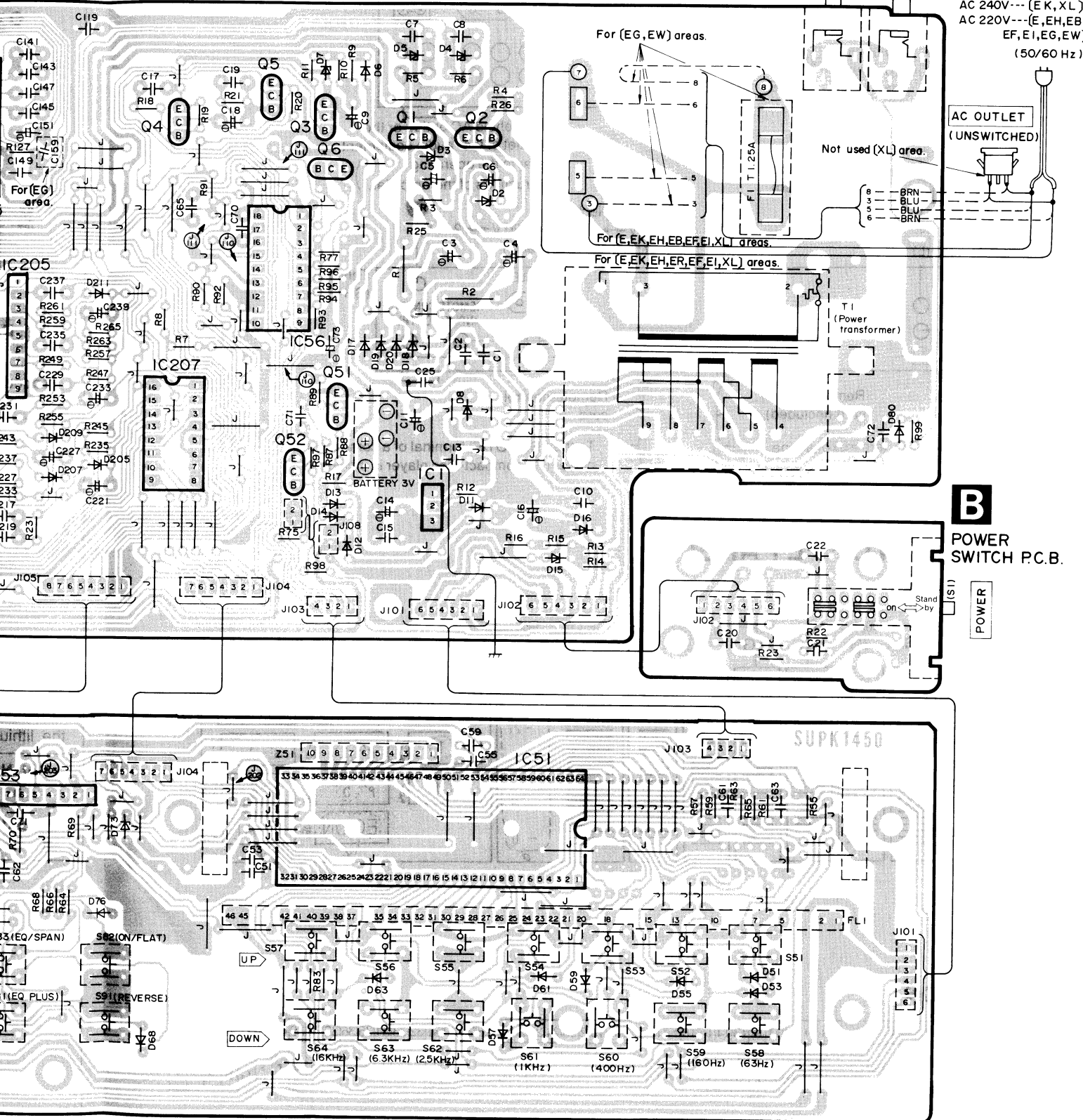
•S85~S90

•S91

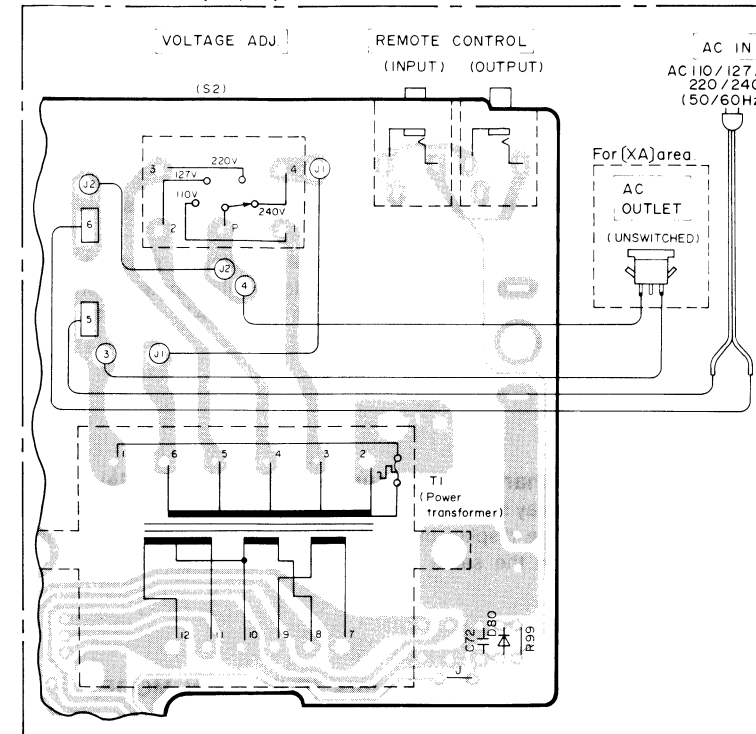
CAUTION
This lith
SUMM2
Ltd.). Pl
location
battery

LITUM
Paristor
tyypise
Paristor

SPECTRAM ANALYZER B.P. FILTER AMP/



Power Source For [XA,XB] areas.



SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Notes:

- S1 : Power switch in "on" position.
- S2 : Voltage selector switch in "240 V" position. (For [XA] and [XB] areas)
- S51~S57 : Equalizer level "up" control switches at each frequency (Lch).
- S58~S64 : Equalizer level "down" control switches at each frequency (Lch).
- S65~S71 : Equalizer level "up" control switches at each frequency (Rch).
- S74~S80 : Equalizer level "down" control switches at each frequency (Rch).
- S81 : Equalization-plus switch.
- S82 : Equalization mode-select switch (EQ ON/FLAT).
- S83 : Display mode switch (EQ/SPECTRUM).
- S84 : Memory switch.
- S85~S90 : Preset-memory switches.
S85; 1 S86; 2 S87; 3
S88; 4 S89; 5 S90; 6
- S91 : Reverse switch.

CAUTION:

This lithium battery is a critical component (Type No. SUMM2CC200. Mfrd by Matsushita Battery Industrial Co., Ltd.). Please observe for the proper polarity and the exact location when replacing it and soldering the replacement lithium battery in.

LITIUM PARISTOI

Pariston saa vaihtaa ainoastaan saman valmistajan saman tyyppiseen paristoon.
Pariston virheellisestä käsittelystä syntyy räjähdysvaara.

TERMINAL GUIDE OF TRANSISTORS, DIODES AND IC'S

NJU4066BD	14 pin	No. 1
LA6324N	16 pin	
MN4051B	18 pin	
LC6528C3189	20 pin	
M5229P	28 pin	
LC7522	64 pin	AN78NO5
HD614042 SH22	64 pin	
M5223L	8 pin	
NJM4559S	9 pin	
2SD1762	DTC143TSTP	
2SB1185	2SC3311, DTA114TS	1SS178TPA7
	2SA1309, 2SD1915	
MA4150, MA4075	RL1N4003NO2	
MA4051, MA4062	MA700A	

Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

- : Spectrum signal.
- : Source signal.
- : Positive voltage lines.
- : Negative voltage lines.

Important safety notice:

Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

*Caution!

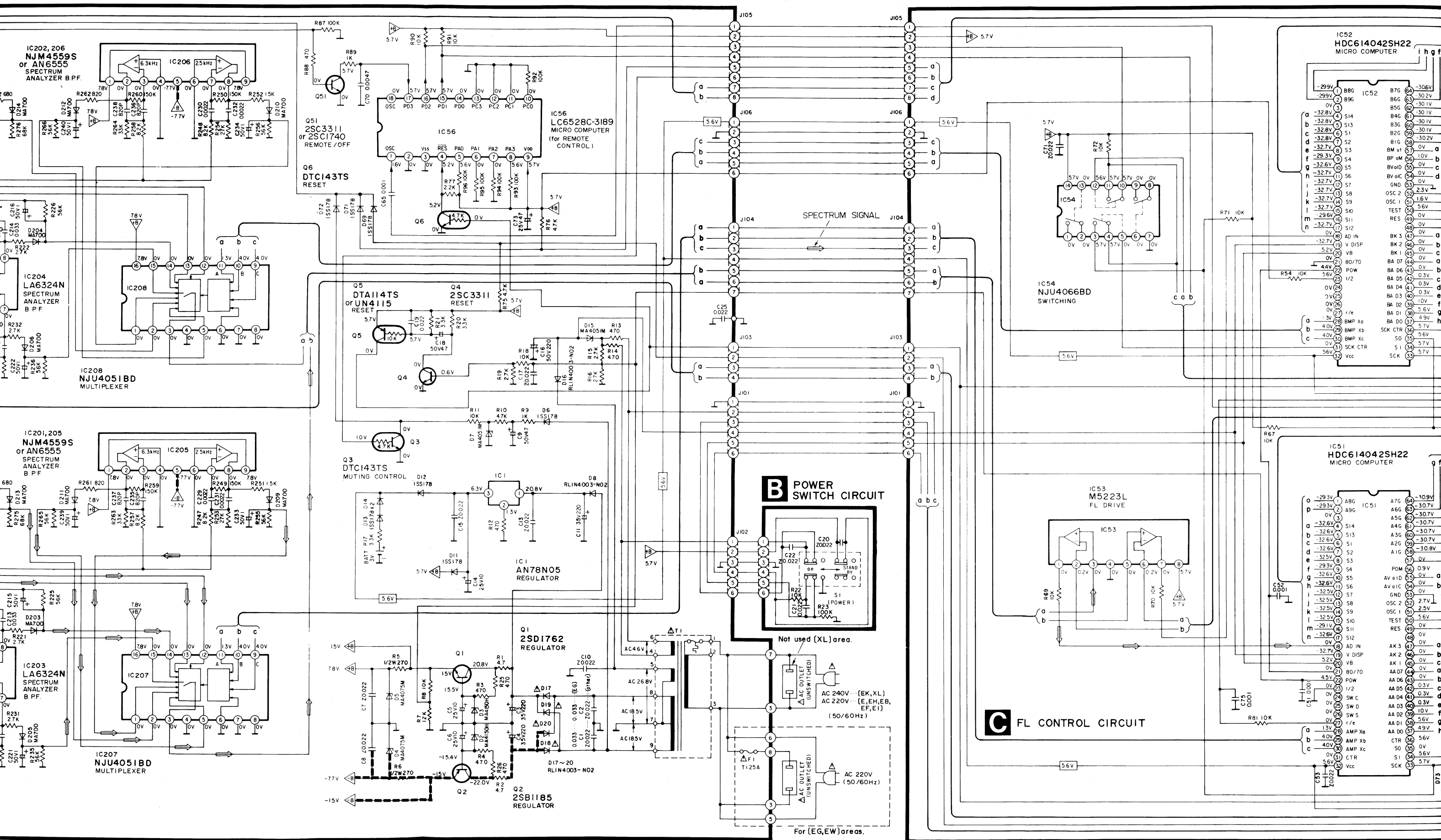
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
*Cover the parts boxes made of plastics with aluminum foil.
*Ground the soldering iron.
*Put a conductive mat on the work table.
*Do not touch the legs of IC or LSI with the fingers directly.

VARNING:

Detta litiumbatteri (av typ Nr. SUMM2CC200, tillverkad av Matsushita Battery Industrial Co., Ltd.) är en kritisk komponent. Var säker om att iakttä korrekt polaritet och exakt läge av litiumbatteriet under ersättning och lödning av ersättningsbatteriet.

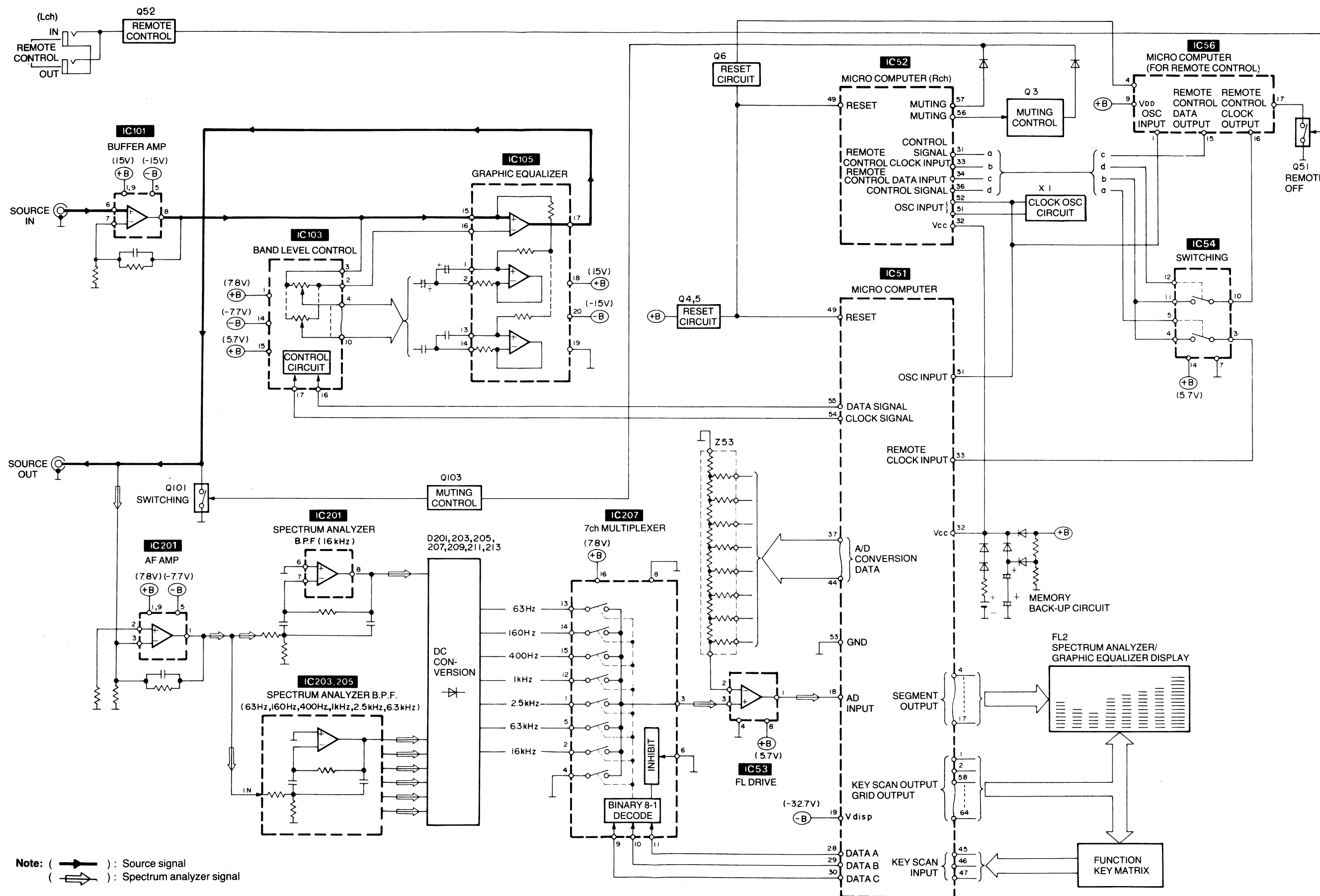
ADVARSEL:

Lithiumbatteriet er en vigtig komponent (type nr SUMM2CC200. Fremstillet af Matsushita Battery Industrial Co., Ltd.). Husk rigtig polaritet og placering ved udskiftning og når De lodder det nye lithiumbatteri fast.

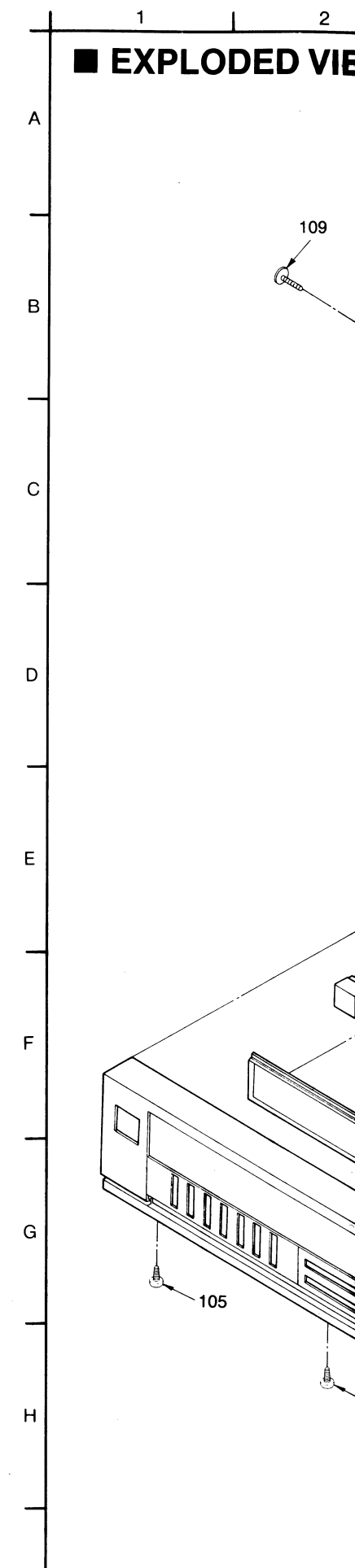


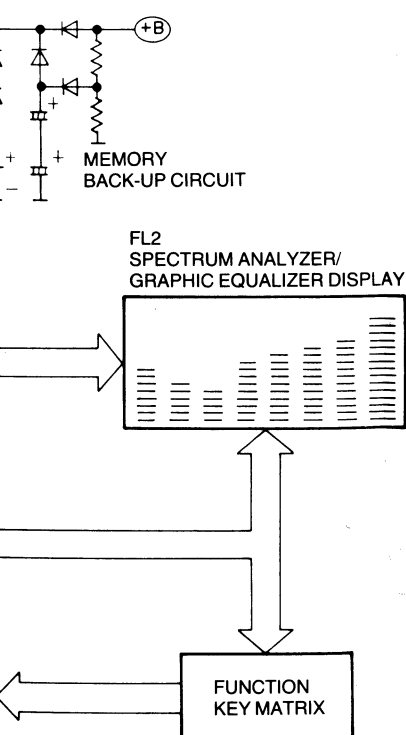


BLOCK DIAGRAM



EXPLODED VIEW





This exploded view diagram illustrates the assembly of a server chassis. The components are numbered as follows:

- 1:** Power cord
- 2:** I/O connector
- 3:** Chassis base plate
- 4 (x2):** Feet
- 5:** Front bezel
- 6:** Front panel
- 7:** Front panel bracket
- 8:** Front panel bracket
- 9:** Front panel bracket
- 10:** Front panel bracket
- 11:** Front panel bracket
- 12:** Front panel bracket
- 13:** Front panel bracket
- 14:** Front panel bracket
- 15 (x9):** Screws
- 16:** Screws
- 17:** Screws
- 18:** Screws
- 19:** Chassis top cover
- 20:** Chassis top cover
- 21:** Chassis top cover
- 22:** Chassis top cover
- 23:** Chassis top cover
- 24:** Chassis top cover
- 25:** Chassis top cover
- 26:** Chassis top cover
- 27:** Chassis top cover
- 28:** Chassis top cover
- 29:** Chassis top cover
- 30:** Chassis top cover
- 31:** Chassis top cover
- 32:** Chassis top cover
- 33:** Chassis top cover
- 34:** Chassis top cover
- 35:** Chassis top cover
- 36:** Chassis top cover
- 101 (x9):** Screws
- 102:** Screws
- 103:** Screws
- 104:** Screws
- 105:** Screws
- 106:** Screws
- 107:** Screws
- 108:** Screws
- 109:** Screws

Assembly instructions and notes:

- For [EK] area only:** Install component 33.
- For [EX], [EW], [EI], [EG], [EB], [EF], [EH] and [XA] areas:** Install component 2.
- For [XL] area only:** Install component 34.



Pin No.	Symbol	I/O	Function
1	D11	O	FL meter's all-band grid output.
2	D12	O	FL meter's function grid output.
3	D13	O	FL meter's function segment output.
4	D14	O	FL meter's scale (+12 ~ -12) segment output when EQ is on.
5	D15	O	-12 dB segment output to FL meter.
6	R00	O	+12 dB segment output to FL meter.
7	R01	O	+10 dB segment output to FL meter.
8	R02	O	+8 dB segment output to FL meter.
9	R03	O	+6 dB segment output to FL meter.
10	R10	O	+4 dB segment output to FL meter.
11	R11	O	+2 dB segment output to FL meter.
12	R12	O	0 dB segment output to FL meter.
13	R13	O	-2 dB segment output to FL meter.
14	R20	O	-4 dB segment output to FL meter.
15	R21	O	-6 dB segment output to FL meter.
16	R22	O	-8 dB segment output to FL meter.
17	R23	O	-10 dB segment output to FL meter.
18	RA0	I	A/D input, high withstand voltage.
19	RA1	I	Output power supply (-32 V) for high withstand voltage terminals.
20	R30	I	Power switch on/off detection. H: on, L: off.
21	R31	I	Mode selector terminal. H: Active mode, L: Stop mode.
22	R32	I	Mode selector terminal. H: Active mode, L: Stop mode.
23	R33	I	MCU check. H: IC52, L: IC51.
24	R50	—	—
25	R51	—	—
26	R52	—	—
27	R53	O	Equalizer ON/OFF control.
28	R60	O	MPX data A output.
29	R61	O	MPX data B output.
30	R62	O	MPX data C output.
31	R63	O	Analog switch control.
32	VCC	I	5 V power supply.

REPLACEMENT PARTS LIST

Notes : * Important safety notice : Components identified by  mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts. * Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.) Parts without these indications can be used for all areas.

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
INTEGRATED CIRCUITS			D75	MA700A	DIODE
IC1	AN78N05	I.C. REGULATOR	D76	MA700A	DIODE
IC51	HD614042SH22	I.C., MICROCOMPUTER	D77	MA700A	DIODE
IC52	HD614042SH22	I.C., MICROCOMPUTER	D78	MA700A	DIODE
IC53	M5223L	I.C. FL DRIVE	D80	1SS178	DIODE
IC54	NJU4066BD	I.C. ANALOG SWITCH	D201	MA700A	DIODE
IC56	LC6528C-3189	I.C. MICRO COM.	D202	MA700A	DIODE
IC101	NJM4559S	I.C. BUFFER	D203	MA700A	DIODE
IC102	LC7522	I.C. BAND LEVEL	D204	MA700A	DIODE
IC103	LC7522	I.C. BAND LEVEL	D205	MA700A	DIODE
IC104	M5229P	I.C. EQ	D206	MA700A	DIODE
IC105	M5229P	I.C. EQ	D207	MA700A	DIODE
IC201	NJM4559S	I.C. B.P.F.	D208	MA700A	DIODE
IC202	NJM4559S	I.C. B.P.F.	D209	MA700A	DIODE
IC203	LA6324N	I.C. B.P.F.	D210	MA700A	DIODE
IC204	LA6324N	I.C. B.P.F.	D211	MA700A	DIODE
IC205	NJM4559S	I.C. B.P.F.	D212	MA700A	DIODE
IC206	NJM4559S	I.C. B.P.F.	D213	MA700A	DIODE
IC207	NJU4051BD	I.C. MPX	D214	MA700A	DIODE
IC208	NJU4051BD	I.C. MPX	COILS AND TRANSFORMERS		
TRANSISTORS			T1 	SLTK5K17	POWER TRANSFORMER
Q1	2SD1762DEF	TRANSISTOR	(EX, EH, EB)		
Q2	2SB1185DEF	TRANSISTOR	(EF, EI, EW)		
Q3	DTC143TSTP	TRANSISTOR	(EG)		
Q4	2SC3311A-Q	TRANSISTOR	T1 	SLTK5K18	POWER TRANSFORMER
Q5	DTA114ESTP	TRANSISTOR	(EK, XL)		
Q6	DTC143TSTP	TRANSISTOR	T4 	SLTK5K19	POWER TRANSFORMER
Q51	2SC3311A-Q	TRANSISTOR	(XB, XA)		
Q52	2SA1309QRS	TRANSISTOR	COMPONENT COMBINATIONS		
Q101	2SD1915T	TRANSISTOR	Z51	EXBF10L795J	COMBINATION COM
Q102	2SD1915T	TRANSISTOR	Z52	EXBF10L795J	COMBINATION COM
Q103	2SA1309QRS	TRANSISTOR	Z101	EXBF8E224J	COMPONENT COMBINATION
DIODES			Z102	EXBF8E224J	COMPONENT COMBINATION
D2	MA4150M	DIODE	DISPLAYS		
D3	MA4150M	DIODE	FL1	SADBG511GK	DISPLAY TUBE
D4	MA4075M	DIODE	FL2	SADBG511GK	DISPLAY TUBE
D5	MA4075M	DIODE	FUSES		
D6	1SS178	DIODE	F1 	XBA2C12TR0	FUSE
D7	MA4051-M	DIODE	(EW, EG)		
D8	RL1N4003N02	DIODE	SWITCHES		
D11	1SS178	DIODE	S1 	SSHK80	SW. POWER
D12	1SS178	DIODE	S2 	SSR187-1	SW. VOLTAGE SELECTOR
D13	1SS178	DIODE	(XB, XA)		
D14	1SS178	DIODE	S51	SSGK7	KEYBOAED SWITCH
D15	MA4051-M	DIODE	S52	SSGK7	KEYBOAED SWITCH
D16	RL1N4003N02	DIODE	S53	SSGK7	KEYBOAED SWITCH
D17	RL1N4003N02	DIODE	S54	SSGK7	KEYBOAED SWITCH
D18	RL1N4003N02	DIODE	S55	SSGK7	KEYBOAED SWITCH
D19	RL1N4003N02	DIODE	S56	SSGK7	KEYBOAED SWITCH
D20	RL1N4003N02	DIODE	S57	SSGK7	KEYBOAED SWITCH
D51	1SS178	DIODE	S58	SSGK7	KEYBOAED SWITCH
D52	1SS178	DIODE	S59	SSGK7	KEYBOAED SWITCH
D53	1SS178	DIODE	S60	SSGK7	KEYBOAED SWITCH
D54	1SS178	DIODE	S61	SSGK7	KEYBOAED SWITCH
D55	1SS178	DIODE	S62	SSGK7	KEYBOAED SWITCH
D56	1SS178	DIODE	S63	SSGK7	KEYBOAED SWITCH
D57	1SS178	DIODE	S64	SSGK7	KEYBOAED SWITCH
D58	1SS178	DIODE	S65	SSGK7	KEYBOAED SWITCH
D59	1SS178	DIODE	S66	SSGK7	KEYBOAED SWITCH
D60	1SS178	DIODE	S67	SSGK7	KEYBOAED SWITCH
D61	1SS178	DIODE	S68	SSGK7	KEYBOAED SWITCH
D62	1SS178	DIODE	S69	SSGK7	KEYBOAED SWITCH
D63	1SS178	DIODE	S70	SSGK7	KEYBOAED SWITCH
D64	1SS178	DIODE	S71	SSGK7	KEYBOAED SWITCH
D66	1SS178	DIODE	S74	SSGK7	KEYBOAED SWITCH
D68	1SS178	DIODE	S75	SSGK7	KEYBOAED SWITCH
D69	1SS178	DIODE	S76	SSGK7	KEYBOAED SWITCH
D71	1SS178	DIODE	S77	SSGK7	KEYBOAED SWITCH
D72	1SS178	DIODE	S78	SSGK7	KEYBOAED SWITCH
D73	MA4062-M	DIODE			

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
S79	SSGK7	KEYBOAED SWITCH	S88	EVQQB011W	SW
S80	SSGK7	KEYBOAED SWITCH	S89	EVQQB011W	SW
S81	EVQQB011W	SW	S90	EVQQB011W	SW
S82	EVQQB011W	SW	S91	EVQQB011W	SW
S83	EVQQB011W	SW	BATTERY		
S84	EVQQB011W	SW	BAT1	SUMM2CC200	LITHIUM BATTERY
S85	EVQQB011W	SW	OTHERS		
S86	EVQQB011W	SW	X1	EF0FC400A43	OSCILLATOR
S87	EVQQB011W	SW			

CABINET PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
CABINET AND CHASSIS			13	SBCK76B	BUTTON
1 	SFDAB31E01-M	POWER CORD	14	SBCK66-1	BUTTON
(EX, EH, EB)			15	SHE187-K	SPACER
(EF, EI, EW)			16	SJJK47	JACK, SOCKET
(EG)			17	SHRK936	PLASTIC SPACER
1 	SJAG23	POWER CORD	18	SHRK937	PLASTIC SPACER
(XL)			19	SKCK241K16	CABINET
1 	SJA182	POWER CORD	20	SGUK29B	FILTER
(XB)			22	SJF3057-8NA	TERMINAL BOARD
1 	SJA186	POWER CORD	23	SHR301	CLAMPER
(XA)			24	SJS0671DS	CONNECTOR(6P)
1 	SJA189	POWER CORD	25	SJSD0405	CONNECTOR(4P)
(EK)			25	SJSK90403DS	CONNECTOR(4P)
2 	SJS9221-1	SOCKET	26	SJSD0605	CONNECTOR(6P)
(XA)			26	SJSK90603DS	CONNECTOR(6P)
2 	SJS9225	AC OUTLET	27	SJSD0705	CONNECTOR(7P)
(EX, EH, EB)			27	SJSK90703DS	CONNECTOR(7P)
(EF, EI, EW)			28	SJSD0805	CONNECTOR
(EG)			28	SJSK90803DS	CONNECTOR
2 	SJS9332B	AC OUTLET	29	SJT30640LX-V	CONNECTOR
(EK)			30	SJSD0405	CONNECTOR(4P)
5	SGPK480-1D	REAR PANEL	30	SJSD0605	CONNECTOR(6P)
(EX)			30	SJSD0705	CONNECTOR(7P)
5	SGPK480-1E	REAR PANEL	30	SJSD0805	CONNECTOR
(EW)			31	SJTK30203PHE	TERMINAL
5	SGPK480-1F	REAR PANEL	31	SJTK30603PHW	TERMINAL
(EH, EB, EF)			32	SHR127	SPACER, POWER CORD
(EI, EG)			33	SJS9332A	AC OUTLET COVER
5	SGPK480-2B	REAR PANEL	(EK)		
(EK)			34	SFEZQ34G01	CLAMPER
5	SGPK480-3B	REAR PANEL	(XL)		
(XL)			35	SJTK30203PHE	TERMINAL
5	SGPK480-4D	REAR PANEL	36	SJT347	FUSE HOLDER
(XA)			(EW, EG)		
5	SGPK480-5B	REAR PANEL	SCREWS, WASHERS AND NUTS		
(XB)			101	XTV3+10G	SCREW
6	SGWKHE75-KE	FRONT PANEL	102	XTB3+8G	SCREW
7	SGXK129	ORNAMENT	103	XTB3+8GFZ	SCREW
8	SGXK127A	ORNAMENT	104	XTB3+8JFZ	SCREW
9	SDUK17A	FILTER	105	XTBS3+8JFZ1	SCREW
10	SBCK74	BUTTON	106	XTW3+20T	SCREW
11	SBCK75A	BUTTON	107	XTBS3+20F1	SCREW
12	SBCK76A	BUTTON	108	XTB3+8JFZ	SCREW
			109	SNE2129-1	SCREW

PACKING PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
PACKING MATERIAL			ACCESSORIES		
P1	SPGK334	PACKING CASE	A1	SQFK10186	INSTRUCTION BOOK
(EX, EH, EB)			(EX, EH, EB)		
(EI, EW, EG)			(EW)		
(XL, XB, XA)			A1	SQFK10187	INSTRUCTION BOOK
P1	SPGK335	PACKING CASE	(EG)		
(EF)			A1	SQFK10188	INSTRUCTION BOOK
P1	SPGK336	PACKING CASE	(EX, XL, XB)		
(EK)			A1	SQFK10189	INSTRUCTION BOOK
P2	SPSK133	PAD(L)	(EF, XA)		
P3	SPSK134	PAD(R)	A1	SQFK10190	INSTRUCTION BOOK
P4	SPPK56	PROTECTION COVER	(EI)		
P5	SFYF10A30	POLYETHYLENE BAG	A2 	RJP120ZBS-H	AC PLUG ADAPTOR
			A3	SJPK2202-1	CORD
			A4	SJP2257T	CORD

RESISTORS AND CAPACITORS

Notes : * Important safety notice :

Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)

Parts without these indications can be used for all areas.

Numbering System of Resistor

Example:

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1K Ω)
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470 Ω)

Numbering System of Capacitor

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001 μ F)	Tolerance	Peculiarity
ECEA	50	M	330	
Type	Voltage (50V)	Peculiarity	Value (33 μ F)	

● Capacity are in microfarads (μ F) unless specified otherwise, P= Pico-farads (pF) F = Farads (F).● Resistance are in ohms (Ω), unless specified otherwise, 1K = 1,000 Ω , 1M = 1,000k Ω

Resistor Type	Wattage	Tolerance
ERD : Carbon	10 : 1/8W 12 : 1/2W	J : $\pm 5\%$
ERG : Metal Oxide	14 : 1/4W 25 : 1/4W	F : $\pm 1\%$
ERQ : Fuse Type Metal	1A : 1W 18 : 1/8W	G : $\pm 2\%$
ERX : Metal Film	S2 : 1/4W S1 : 1/2W	J : $\pm 5\%$
ERD L : Carbon (chip)	2F : 1/4W 50 : 1/2W	K : $\pm 10\%$
ERO K : Metal Film (chip)	2A : 2W 3A : 3W	M : $\pm 20\%$
ERC : Solid	6G : 1/10W 8G : 1/8W	
ERF : Incombustible Box-Shaped		
ERM : Wire-Wound		
RRJ : Chip Resistor		
ERJ : Chip Resistor		

Capacitor Type	Voltage	Tolerance
ECE : Electrolytic	0J : 6.3V 1A : 10V	K : $\pm 10\%$
ECCD : Ceramic	1C : 16V 1E : 25V	M : $\pm 20\%$
ECKD : Ceramic Capacitor	1H : 50V 1V : 35V	Z : +80 % -20
ECOM : Polyester	50 : 50V 05 : 50V	J : $\pm 5\%$
ECOP : Polypropylene	2H : 500V 2A : 100V	G : $\pm 2\%$
ECG : Ceramic	1 : 100V 1J : 63V	F : $\pm 1\%$
ECEA N : Non Polar Electrolytic	KC : 400V AC	C : ± 0.25 pF
QCU : Ceramic (Chip Type)	KC : 125V AC	D : ± 0.5 pF
ECUX : Ceramic (Chip Type)	(UL)	
ECF : Semiconductor		
EECW : Liquid electrolyte double layer capacitor		

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
RESISTORS(VALUE, WATTAGE)			R69	ERDS2TJ103	10K 1/4	R119	ERDS2TJ104	100K 1/4
R1	ERD2FCJ4R7	4.7 1/4	R70	ERDS2TJ103	10K 1/4	R120	ERDS2TJ104	100K 1/4
R2	ERD2FCJ4R7	4.7 1/4	R71	ERDS2TJ103	10K 1/4	R121	ERDS2TJ222	2.2K 1/4
R3	ERDS2TJ471	470 1/4	R72	ERDS2TJ103	10K 1/4	R122	ERDS2TJ222	2.2K 1/4
R4	ERDS2TJ471	470 1/4	R74	ERDS2TJ684	680K 1/4	R123	ERDS2TJ102	1K 1/4
R5	ERDS1FJ271	270 1/2	R75	ERDS2TJ472	4.7K 1/4	R124	ERDS2TJ102	1K 1/4
R6	ERDS1FJ271	270 1/2	R76	ERDS2TJ472	4.7K 1/4	R125	ERDS2TJ104	100K 1/4
R7	ERDS2TJ123	12K 1/4	R77	ERDS2TJ222	2.2K 1/4	R126	ERDS2TJ103	10K 1/4
R8	ERDS2TJ103	10K 1/4	R81	ERDS2TJ103	10K 1/4	R127	ERDS2TJ123	12K 1/4
R9	ERDS2TJ102	1K 1/4	R83	ERDS2TJ181	180 1/4	R128	ERDS2TJ123	12K 1/4
R10	ERDS2TJ472	4.7K 1/4	R84	ERDS2TJ181	180 1/4	R129	ERDS2TJ153	15K 1/4
R11	ERDS2TJ103	10K 1/4	R87	ERDS2TJ104	100K 1/4	R130	ERDS2TJ153	15K 1/4
R12	ERDS2TJ471	470 1/4	R88	ERDS2TJ471	470 1/4	R131	ERDS2TJ103	10K 1/4
R13	ERDS2TJ471	470 1/4	R89	ERDS2TJ102	1K 1/4	R132	ERDS2TJ103	10K 1/4
R14	ERDS2TJ471	470 1/4	R90	ERDS2TJ103	10K 1/4	R201	ERDS2TJ154	150K 1/4
R15	ERDS2TJ272	2.7K 1/4	R91	ERDS2TJ103	10K 1/4	R202	ERDS2TJ154	150K 1/4
R16	ERDS2TJ272	2.7K 1/4	R92	ERDS2TJ104	100K 1/4	R203	ERDS2TJ334	330K 1/4
R17	ERDS2TJ332	3.3K 1/4	R93	ERDS2TJ104	100K 1/4	R204	ERDS2TJ334	330K 1/4
R18	ERDS2TJ103	10K 1/4	R94	ERDS2TJ104	100K 1/4	R205	ERDS2TJ104	100K 1/4
R19	ERDS2TJ272	2.7K 1/4	R95	ERDS2TJ104	100K 1/4	R206	ERDS2TJ104	100K 1/4
R20	ERDS2TJ332	3.3K 1/4	R96	ERDS2TJ104	100K 1/4	R207	ERDS2TJ183	18K 1/4
R21	ERDS2TJ332	3.3K 1/4	R97	ERDS2TJ223	22K 1/4	R208	ERDS2TJ183	18K 1/4
R22	ERDS2TJ103	10K 1/4	R98	ERDS2TJ473	47K 1/4	R209	ERDS2TJ334	330K 1/4
R23	ERDS2TJ104	100K 1/4	R99	ERDS2TJ103	10K 1/4	R210	ERDS2TJ334	330K 1/4
R25	ERDS2TJ471	470 1/4	R101	ERDS2TJ102	1K 1/4	R211	ERDS2TJ272	2.7K 1/4
R26	ERDS2TJ471	470 1/4	R102	ERDS2TJ102	1K 1/4	R212	ERDS2TJ272	2.7K 1/4
R54	ERDS2TJ103	10K 1/4	R103	ERDS2TJ102	1K 1/4	R213	ERDS2TJ683	68K 1/4
R55	ERDS2TJ102	1K 1/4	R104	ERDS2TJ102	1K 1/4	R214	ERDS2TJ683	68K 1/4
R56	ERDS2TJ102	1K 1/4	R105	ERDS2TJ154	150K 1/4	R215	ERDS2TJ563	56K 1/4
R57	ERDS2TJ103	10K 1/4	R106	ERDS2TJ154	150K 1/4	R216	ERDS2TJ563	56K 1/4
R58	ERDS2TJ103	10K 1/4	R107	ERDS2TJ104	100K 1/4	R217	ERDS2TJ822	8.2K 1/4
R59	ERDS2TJ103	10K 1/4	R108	ERDS2TJ104	100K 1/4	R218	ERDS2TJ822	8.2K 1/4
R60	ERDS2TJ103	10K 1/4	R109	ERDS2TJ472	4.7K 1/4	R219	ERDS2TJ154	150K 1/4
R61	ERDS2TJ103	10K 1/4	R110	ERDS2TJ472	4.7K 1/4	R220	ERDS2TJ154	150K 1/4
R62	ERDS2TJ103	10K 1/4	R111	ERDS2TJ473	47K 1/4	R221	ERDS2TJ272	2.7K 1/4
R63	ERDS2TJ221	220 1/4	R112	ERDS2TJ473	47K 1/4	R222	ERDS2TJ272	2.7K 1/4
R64	ERDS2TJ221	220 1/4	R113	ERDS2TJ123	12K 1/4	R223	ERDS2TJ333	33K 1/4
R65	ERDS2TJ221	220 1/4	R114	ERDS2TJ123	12K 1/4	R224	ERDS2TJ333	33K 1/4
R66	ERDS2TJ221	220 1/4	R115	ERDS2TJ223	22K 1/4	R225	ERDS2TJ563	56K 1/4
R67	ERDS2TJ103	10K 1/4	R116	ERDS2TJ223	22K 1/4	R226	ERDS2TJ563	56K 1/4
R68	ERDS2TJ221	220 1/4	R117	ERDS2TJ104	100K 1/4	R227	ERDS2TJ822	8.2K 1/4
			R118	ERDS2TJ104	100K 1/4	R228	ERDS2TJ822	8.2K 1/4

Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.	Ref. No.	Part No.	Value.
R229	ERDS2TJ154	150K 1/4	C8	ECKD1H223PF	0.022 50	C138	ECFTD273KXL	0.027 25
R230	ERDS2TJ154	150K 1/4	C9	ECEA1HK4R7	4.7 50	C139	ECKD1H562KB	0.0056 50
R231	ERDS2TJ272	2.7K 1/4	C10	ECKD1H223PF	0.022 50	C140	ECKD1H562KB	0.0056 50
R232	ERDS2TJ272	2.7K 1/4	C11	ECEA1VU221	220 35	C141	△ ECFTD103KXL	0.01 25
R233	ERDS2TJ333	33K 1/4	C13	ECKD1H223PF	0.022 50	C142	△ ECFTD103KXL	0.01 25
R234	ERDS2TJ333	33K 1/4	C14	ECEA1EK100	10 25	C143	ECKD1H222KB	0.0022 50
R235	ERDS2TJ563	56K 1/4	C15	ECKD1H223PF	0.022 50	C144	ECKD1H222KB	0.0022 50
R236	ERDS2TJ563	56K 1/4	C16	ECEA1HU221	220 50	C145	ECKD1H472KB	0.0047 50
R237	ERDS2TJ822	8.2K 1/4	C17	ECKD1H223PF	0.022 50	C146	ECKD1H472KB	0.0047 50
R238	ERDS2TJ822	8.2K 1/4	C18	ECEA1HK4R7	4.7 50	C147	ECKD1H681KB	680P 50
R239	ERDS2TJ154	150K 1/4	C19	ECFTD223KXL	0.022 25	C148	ECKD1H681KB	680P 50
R240	ERDS2TJ154	150K 1/4	C20	ECBT1E223ZF	0.022 25	C149	ECCD1H121K	120P 50
R241	ERDS2TJ272	2.7K 1/4	C21	ECBT1E223ZF	0.022 25	C150	ECCD1H121K	120P 50
R242	ERDS2TJ272	2.7K 1/4	C22	ECBT1E223ZF	0.022 25	C151	ECEA1EK470	47 25
R243	ERDS2TJ333	33K 1/4	C25	ECBT1E223ZF	0.022 25	C152	ECEA1EK470	47 25
R244	ERDS2TJ333	33K 1/4	C51	ECBT1H102KB5	0.001 50	C159	ECCD1H101K	100P 50
R245	ERDS2TJ563	56K 1/4	C52	ECBT1H102KB	0.001 50	(EG)		
R246	ERDS2TJ563	56K 1/4	C53	ECKD1H223PF	0.022 50	C160	ECCD1H101K	100P 50
R247	ERDS2TJ822	8.2K 1/4	C54	ECKD1H223PF	0.022 50	(EG)		
R248	ERDS2TJ822	8.2K 1/4	C55	ECKD1H223PF	0.022 50	C160	ECKD1H103PF	0.01 50
R249	ERDS2TJ154	150K 1/4	C56	ECKD1H223PF	0.022 50	C160	ECKD1H103PF	0.01 50
R250	ERDS2TJ154	150K 1/4	C58	ECKD1H223PF	0.022 50	C161	ECKD1H103PF	0.01 50
R251	ERDS2TJ152	1.5K 1/4	C59	ECKD1H223PF	0.022 50	(EG)		
R252	ERDS2TJ152	1.5K 1/4	C60	ECCD1H220KC	22P 50	C162	ECKD1H103PF	0.01 50
R253	ERDS2TJ273	27K 1/4	C61	ECBT1H102KB5	0.001 50	(EG)		
R254	ERDS2TJ273	27K 1/4	C62	ECBT1H102KB5	0.001 50	C201	ECEA1HK010	1 50
R255	ERDS2TJ563	56K 1/4	C63	ECBT1H102KB5	0.001 50	C202	ECEA1HK010	1 50
R256	ERDS2TJ563	56K 1/4	C64	ECBT1H102KB5	0.001 50	C203	ECCD1H100KC	10P 50
R257	ERDS2TJ822	8.2K 1/4	C65	ECFTD102KXL	0.001 25	C204	ECCD1H100KC	10P 50
R258	ERDS2TJ822	8.2K 1/4	C66	ECBT1H102KB5	0.001 50	C205	ECFTD333KXL	0.039 25
R259	ERDS2TJ154	150K 1/4	C70	ECKD1H472KB	0.0047 50	C206	ECFTD333KXL	0.039 25
R260	ERDS2TJ154	150K 1/4	C71	ECKD1H223PF	0.022 50	C207	ECFTD333KXL	0.039 25
R261	ERDS2TJ821	820 1/4	C71	ECKD1H223PF	0.022 50	C208	ECFTD333KXL	0.039 25
R262	ERDS2TJ821	820 1/4	C72	ECKD1H472KB	0.0047 50	C209	ECEA1HK010	1 50
R263	ERDS2TJ333	33K 1/4	C73	ECEA1EK470	47 25	C210	ECEA1HK010	1 50
R264	ERDS2TJ333	33K 1/4	C75	ECBT1H102KB5	0.001 50	C211	ECFTD333KXL	0.033 25
R265	ERDS2TJ563	56K 1/4	C101	ECKD1H221KB	220P 50	C212	ECFTD333KXL	0.033 25
R266	ERDS2TJ563	56K 1/4	C102	ECKD1H221KB	220P 50	C213	ECFTD333KXL	0.033 25
R267	ERDS2TJ682	6.8K 1/4	C105	ECEA1EK4R7	4.7 25	C214	ECFTD333KXL	0.033 25
R268	ERDS2TJ682	6.8K 1/4	C106	ECEA1EK4R7	4.7 25	C215	ECEA1HK010	1 50
R269	ERDS2TJ124	120K 1/4	C107	ECCD1H121K	120P 50	C216	ECEA1HK010	1 50
R270	ERDS2TJ124	120K 1/4	C108	ECCD1H121K	120P 50	C217	ECFTD123KXL	0.012 25
R271	ERDS2TJ681	680 1/4	C109	ECCD1H101K	100P 50	C218	ECFTD123KXL	0.012 25
R272	ERDS2TJ681	680 1/4	C110	ECCD1H101K	100P 50	C219	ECFTD123KXL	0.012 25
R273	ERDS2TJ273	27K 1/4	C111	ECEA1CKS100	10 16	C220	ECFTD123KXL	0.012 25
R274	ERDS2TJ273	27K 1/4	C112	ECEA1CKS100	10 16	C221	ECEA1HK010	1 50
R275	ERDS2TJ683	68K 1/4	C113	ECEA1HK3R3	3.3 50	C222	ECEA1HK010	1 50
R276	ERDS2TJ683	68K 1/4	C114	ECEA1HK3R3	3.3 50	C223	ECKD1H472KB	0.0047 50
CAPACITORS(VALUE, VOLTAGE)			C117	ECKD1H223PF	0.022 50	C224	ECKD1H472KB	0.0047 50
C1	ECKD1H223PF	0.022 50	C118	ECKD1H223PF	0.022 50	C225	ECKD1H472KB	0.0047 50
(EX, EH, EB)			C119	ECKD1H223PF	0.022 50	C226	ECKD1H472KB	0.0047 50
(EF, E1, EW)			C120	ECKD1H223PF	0.022 50	C227	ECEA1HK010	1 50
(EK, XL, XB)			C121	ECEA1HK010	1 50	C228	ECEA1HK010	1 50
(XA)			C122	ECEA1HK010	1 50	C229	ECKD1H222KB	0.0022 50
C1	ECKD1H333PF	0.033 50	C123	ECEA1HKR22	0.22 50	C230	ECKD1H222KB	0.0022 50
(EG)			C124	ECEA1HKR22	0.22 50	C231	ECKD1H222KB	0.0022 50
C2	ECKD1H223PF	0.022 50	C125	ECEA1HKR47	0.47 50	C232	ECKD1H222KB	0.0022 50
(EX, EH, EB)			C126	ECEA1HKR47	0.47 50	C233	ECEA1HK010	1 50
(EF, E1, EW)			C127	ECFTD823KXL	0.082 25	C234	ECEA1HK010	1 50
(EK, XL, XB)			C128	ECFTD823KXL	0.082 25	C235	ECKD1H821KB	820P 50
(XA)			C129	ECEA1HKR15	0.15 50	C236	ECKD1H821KB	820P 50
C2	ECKD1H333PF	0.033 50	C130	ECEA1HKR15	0.15 50	C237	ECKD1H821KB	820P 50
(EG)			C131	ECFTD333KXL	0.033 25	C238	ECKD1H821KB	820P 50
C3	ECEA1VU221	220 35	C132	ECFTD333KXL	0.033 25	C239	ECEA1HK010	1 50
C4	ECEA1VU221	220 35	C133	ECFTD683KXL	0.068 25	C240	ECEA1HK010	1 50
C5	ECEA1EK100	10 25	C134	ECFTD683KXL	0.068 25	C241	ECKD1H391KB	390P 50
C6	ECEA1EK100	10 25	C135	ECFTD153KXL	0.015 25	C242	ECKD1H391KB	390P 50
C7	ECKD1H223PF	0.022 50	C136	ECFTD153KXL	0.015 25	C243	ECKD1H391KB	390P 50
			C137	ECFTD273KXL	0.027 25	C244	ECKD1H391KB	390P 50
						C245	ECEA1HK010	1 50
						C246	ECEA1HK010	1 50